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EXAMINER
BASI, NIRMAL SINGH

ART UNIT	PAPER NUMBER
1646	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/036,568	Applicant(s) WILLSON ET AL.	
	Examiner Nirmal S. Basi	Art Unit 1646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-45, 47 and 50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 37, 42, 43 and 47 is/are allowed.
- 6) ☒ Claim(s) 38-41, 44-45 and 48-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

Applicant's submission filed on 9/21/06 has been entered.

2. Amendment filed 9/21/06 has been entered. Claims 37-45 and 47-50 are pending in the application. Claims 1-36, 46 and 51 have been cancelled.

Applicant's arguments have been fully considered and are addressed below.

Claim Rejection, 35 U.S.C. 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 41 and 45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Amended claim 41 is newly rejected for being indefinite because it depends on cancelled claim 30. Based on the Amendment, page 4, it appears that applicant may have intended to amend the claim to depend on claims "37 or 40" and not on "30 or 40" and that typographical error has occurred.

Applicant's arguments:

Applicants traverse examiners rejection of claims 41 and 45 as pertaining to "soluble form" and mature form". Applicants state: "As to the term "mature form", Applicants respectfully submit that the term represents a form of the NR4 polypeptide that is different in length from the newly translated NR4 polypeptide as a result of post-translational processing. In the context of the present invention, the "mature form" of the NR4 protein can be glycosylated or unglycosylated, depending on the expression system employed in the recombinant production of the protein." Applicants further argue that based on the art of relating protein structure (exhibits 2-6) the "soluble form" and a "mature form" of human NR4 can be defined without a specific disclosure in the specification of the precise starting and ending amino acid residues of the respective forms. Applicant's arguments have been fully considered but they are not found persuasive. **The specification does not define the terms "soluble form" or "mature form". The art does not define "soluble form" or "mature form" of NR4.** The specification does not disclose that the definition of "mature form" is unglycosylated. The specification does not disclose that the definition of "mature form" is glycosylated. The glycosylation pattern of the protein is not disclosed. It is acknowledged that proteins undergo posttranslational processing but how the mature form specially differs from the newly translated NR4 polypeptide form is not disclosed. Further, even if any of the methods known in the art are used to study the structure of the claimed invention there is guarantee they will all give the same answer as to structure of the "soluble form" or "mature form". For example the default parameters used to test the methods is not disclosed. The point being there will still be ambiguity as to the exact nature of the "soluble form" or "mature form". If the exact size of the "soluble form" or "mature form" cannot be defined as it relates to the polypeptide disclosed in SEQ ID NO:4 then the metes and bounds of the claim cannot be defined. The rejections of claims 41 and 45 are maintained for reason of record in the previous Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 38-41, 44-45 and 48-50 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the isolated polypeptide of SEQ ID NO:4, wherein said polypeptide binds at least one of human IL-13 and human IL-4 does not reasonably provide enablement for polypeptides that comprise parts of fragments of SEQ ID NO:4 without a defined biological activity. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.
5. Claims 38-41, 44-45, 48-50 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Applicant's arguments:

Applicants argue: Claims 38-41, 44 and 48-50 are rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to satisfy the enablement requirement. Claims 38, 41, 44, and 48 are separately rejected under 35 U.S.C. §112, first paragraph, for allegedly failing to satisfy the written description

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requirement. The Examiner's principal concern appears to be directed to the recitation of "a part or fragment of SEQ ID NO: 4" in independent claim 38. Essentially, the Examiner contends that the recited "part or fragment of SEQ ID NO: 4" is not defined by any structural or functional feature.

Applicants further argue and state that the, "specification does provide guidance for "parts" and "fragments" of NR4. For example, Example 6 of the specification (page 37 and Figure 1) defines the various domains of murine NR4 including a signal sequence, an extracellular domain, a transmembrane domain, and a cytoplasmic domain. Example 11 (pages 39-40) discloses that SEQ ID NO: 4 is the human homolog of murine NR4 with 75% similarity at the amino acid level; and Figure 7 aligns the human sequence with the murine sequence. In view of the disclosure in the specification, the term "part or fragment" of SEQ ID NO: 4, as presently recited, are fully supported by the specification. As such, the enablement and written description rejections under 35 U.S.C. §112, first paragraph, are overcome.

Applicant's arguments have been fully considered but are not found persuasive for reason given below

Enablement

Claims 38-41, 44-45, 48-50 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the isolated polypeptide of SEQ ID NO:4, wherein said polypeptide binds at least on of human II-13 and human II-4 does not reasonably provide enablement for polypeptides that comprise parts of fragments of SEQ ID NO:4 without a defined biological activity. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

While the person of ordinary skill in the art would, in light of the specification be able to isolate the polypeptide disclosed in SEQ ID NO:4 the scope of the claims, which encompass derivatives of undefined structure and

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function are not enabled by the disclosure. Further polypeptides comprising fragments of the polypeptide of SEQ ID NO:4 and having no defined function are not enabled. The disclosure does not teach how to make such functional derivatives or other such polypeptides encompassed by the claims. The disclosure does not teach how to use such functional derivatives or other such polypeptides encompassed by the claims which may be inactive or have activities different to that of NR4. The claims encompass every polypeptide known, or yet to be isolated whether it is functional or not. Page 7, lines 3 of the specification discloses the derivatives may be "functional or not" and may be "parts, fragments or portions" of NR4. The claims encompass a polypeptide comprising a part of fragment of the polypeptide of SEQ ID NO:4. A part can be an ion, a single amino acid or a few amino acids. A fragment can be as little as two amino acids. Therefore the claims encompass every polypeptide known to man, applicants are not enabled for this scope. The claims encompass no functional language. Applicant has not disclosed how to use derivatives that do not bind IL-13 or IL-4. Applicant has not disclosed how to use derivatives with no activity.

Although derivatives of IL-13 receptor (polypeptides comprising parts of the polypeptide of SEQ ID NO:4) can be made, said derivatives carry no weight in terms of structure and function and encompasses numerous alterations and reads on unrelated polypeptides. Also polypeptides defined only by comprising "part", which can be one amino acid, carry no weight in terms of structure and function and encompasses numerous alterations and reads on unrelated

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polypeptides. Instant specification does not teach which particular amino acids (parts or fragments) are critical for the functionality of the claimed polypeptide i.e. the critical feature of the invention as it relates to function is not disclosed. Therefore structurally deficient polypeptides containing random mutations would be expected by the skilled artisan to result in molecules encoding inactive or unrelated proteins or polypeptides. For example, Rudinger (see previous office action) states that "it is impossible to attach a unique significance to any residue in a sequence. A given amino acid will not by any means have the same significance in different peptide sequences, or even in different positions of the same sequence". Rudinger further states on page 6 that "the significance of particular amino acid sequences for different aspects of biological activity cannot be predicted *a priori* but must be determined from case to case by painstaking experimental study". Therefore, the lack of guidance provided in the specification as to what minimal structural requirements are necessary for functional protein would prevent the skilled artisan from determining whether any modification, mutation of SEQ ID NO:4 or other protein encompassed by the claims could be made which retains the undisclosed activity of the claimed invention, because any random mutation or modification manifested within said protein itself would be predicted to adversely alter its biologically active 3-dimensional conformation, without undue experimentation to determine otherwise.

The fact remains that the activity of the claimed polypeptides or the actual structure of the polypeptide cannot be envisioned any better when the possible choices are narrowed from all possible molecules to all possible molecules that

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comprise fragments or parts of SEQ ID NO:4. For example, if one skilled in the art were to make a polypeptide with 90% identity to the reference amino acid sequence SEQ ID NO:4, he would be no more able to say whether it inhibits IL-4 binding if the polypeptide was only 10% identical to the reference polypeptide sequence. Nor would he be able to say whether the sequence existed in nature. The specification does not provide any information on what polypeptides apart from those disclosed above are necessary and sufficient for a functional activity. The specification also provides no teachings on what amino acid sequence modifications, e.g. insertions, deletions and substitutions, would be permissible in an active polypeptide that would improve or at least would not interfere with the biological activity or structural features necessary for the biological activity and stability of the protein. Therefore one cannot predict which receptor molecules comprise a biologically active product encompasses by the claims

Written description

Claims 38-41, 44-45, 48-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claims are drawn to polypeptide, comprising a part or fragment of SEQ ID NO:4 with no disclosed activity. The claims either provide a) no functional limitation and b) meaningless structural limitation (comprising a part or fragment of SEQ ID NO:4).. The claims encompass every polypeptide known, or

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yet to be isolated whether it is functional or not. Page 7, lines 3 of the specification discloses the derivatives may be "functional or not" and may be "parts, fragments or portions" of NR4. The phrase "comprising a part or fragment of SEQ ID NO:4 does not sufficiently describe the structure or function of the polypeptides covered by the name. Every protein known to man comprises a part of SEQ ID NO:4 (i.e. a single amino acid) since they share at least one common amino acid. The polypeptides encompassed by the claims have no disclosure of the critical technical feature of the claimed invention or its relationship to function. The critical technical feature encompassed by the polypeptide and how it relates structurally and functionally to the polypeptides of SEQ ID NO:4 is not disclosed. Thus, the claims are drawn to a genus of molecules that vastly varies in structure and function. It would take undue experimentation to discover the polypeptides encompassed by the claim. The specification does not provide any information on what polypeptides apart from SEQ ID NO:4 are necessary and sufficient for a functional activity. The specification also provides no teachings on what amino acid sequence modifications, e.g. insertions, deletions and substitutions, would be permissible in an active receptor polypeptide that would improve or at least would not interfere with the biological activity or structural features necessary for the biological activity and stability of the protein. Therefore one cannot predict the molecules required or a biologically activity. Rather one must engage in case-to-case painstaking experimental study to determine active variants. Consequently, excessive trial and error experimentation would have been

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required to identify the necessary polypeptide derivatives/variants since the structure of said derivatives/variants could not be predicted.

To provide evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, methods of making the claimed product, or any combination thereof. Apart from the polypeptides of SEQ ID NO:4 there is no disclosure of a particular portion of the structure of other molecules that must be conserved and have the functionality of the claimed genus. Accordingly, in the absence of sufficient recitation of distinguishing identifying characteristics, the specification does not provide adequate written description of the claimed genus.

Naming a type of material generically known to exist, in the absence of knowledge as to what that material consists of, is not a description of that material. When one is unable to envision the detailed constitution of a complex chemical compound having a particular function, such as a polypeptide, so as to distinguish it from other materials, as well as a method for obtaining it, conception has not been achieved until reduction to practice has occurred, i.e., until after the polypeptide has been isolated. Thus, claiming all polypeptides that achieve a result without defining what means will do so is not in compliance with the description requirement. Rather, it is an attempt to preempt the future before it has arrived. The claims do not recite a structural relationship between the claimed polypeptide in terms of its structure and related specific function.

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Even if Applicant added an functional limitation to the claims the fact remains that polypeptides with a particular activity or the actual structure of the IL-13 polypeptide cannot be envisioned any better when the possible choices are narrowed from all possible molecules to all possible molecules that for example comprise a part of the polypeptide of SEQ ID NO:4. For example, if one skilled in the art were to make a polypeptide with 90% identity to the reference amino acid sequence SEQ ID NO:4, he would be no more able to say whether it inhibits an undefined cellular receptor activity than if the polypeptide was only 10% identical to the reference polypeptide sequence. Nor would he be able to say whether the sequence existed in nature. In instant case the term "derivative" encompasses billion of compounds.

The specification does not provide any information on what polypeptides apart from the polypeptide of SEQ ID NO:4 are necessary and sufficient for a functional activity. The specification also provides no teachings on what amino acid sequence modifications, e.g. insertions, deletions and substitutions, would be permissible in an active IL-13 receptor polypeptide that would improve or at least would not interfere with the biological activity or structural features necessary for the biological activity and stability of the protein. Therefore one cannot predict which mutation would result in active IL-13 receptor molecules required for a particular biological activity. Rather one must engage in case-to-case painstaking experimental study to determine active derivatives/variants. Consequently, excessive trial and error experimentation would have been

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required to identify the necessary derivatives/variants since the structure of said derivatives/variants could not be predicted.

The specification discloses only one putative amino acid sequences, SEQ ID NO:4 for a polypeptide having the necessary properties of binding IL-13 and/or IL-4 and provides no guidance on obtaining other functional molecules, which would be suitable, even if an activity was added to the claimed invention.

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111 , clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that (he or she) invented what is claimed." (See *Vas-Cath* at page 1116). As discussed above, the skilled artisan cannot envision the detailed chemical structure of the encompassed genus of polypeptides, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required. See *Fiers v. Revel*, 25 USPQ2d 1601 at 1606 (CAFC1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016.

One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481 at 1483. In *Fiddes*, claims directed to mammalian FGF'S were found to be unpatentable due to lack of written description for that broad class.

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Therefore, only the use of the isolated polypeptide disclosed by SEQ ID NO:4 but not the full breadth of the claims meets the written description provision of 35 U.S.C. § 112, first paragraph. Applicant is reminded that Vas-Cath makes clear that the written description provision of 35 U.S.C. 112 is severable from its enablement provision (see page 115).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6.. Claims 38, 44, 45 and 48 are rejected under 35 U.S.C. 102(b) as being anticipated by Kiyoshi et al (US PATENT 5453491, see previous office action).

Kiyoshi discloses a polypeptide (SEQ ID NO:6) comprising a part (amino acid) of SEQ ID NO:4 which can be in recombinant form or comprising a pharmaceutically acceptable carrier. Therefore the disclosure of Kiyoshi meets the limitations of claims 38, 44, 45 and 48 absent evidence to the contrary.

Applicant's arguments:

Applicants argue that in light of the specification, those skilled in the art would not interpret the term "part" of SEQ ID NO: 4 to include simply an amino acid. Applicants state, "As described in the specification, a derivative of an NR4

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molecule, which includes parts or fragments of an NR4 molecule, can be a functional molecule, e.g., capable of binding to IL-13, or a non-functional but immunogenic molecule. See page 7, lines 1-13 of the specification. Those skilled in the art would not consider a single amino acid as "a part" of SEQ ID NO: 4. Accordingly, the §102(b) rejection based on Kiyoshi et al. is overcome and withdrawal thereof is respectfully requested." Applicant's arguments have been fully considered but they are not found persuasive.

To put applicants arguments in perspective the first two paragraphs on page 7, lines 1-13 are recited below in their entirety:

"Reference herein to "recombinant haemopoietin receptor", "NR4", "IL- 13 receptor" or "IL- 13" receptor α -chain" includes reference to **derivatives** thereof such as **parts, fragments, portions**, homologues, hybrids or **analogues** thereof. The **derivatives may be functional or not** or may be non-functional but immunologically interactive with antibodies to all or part of the receptor. Derivatives of the receptor also cover agonists or antagonists of receptor-ligand interaction. Function is conveniently defined by an ability of N-R4 to interact with IL-13 or its derivatives or for soluble NR4 to compete with IL-13-induced activities of certain cells. Particularly preferred derivatives contemplated by the present invention include derivatives of IL-13 receptor α -chain which are capable of binding IL-13 with high affinity or with IL-13 and IL-4 with high affinity; derivatives also encompass chimeric molecules such as between IL-,13 receptor n-chain and, for example, IL--4 receptor a-chain which also bind IL-13 with high affinity.

As disclosed in the specification a derivative of NR4 includes a part, fragment, portion or analogue of NR4. The derivatives may be functional or not. There is nothing in the specification that argues away from a single amino acid being interpreted as a part, fragment or portion of NR4. therefore the rejection is maintained.

7. Claims 37, 42, 43, 47 are allowable.

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Advisory

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nirmal S. Basi whose telephone number is 571-272-0868. The examiner can normally be reached on 9:00 AM-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Nickol can be reached on 571-272-0835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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N/S

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